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MEETING NOTICE AND AGENDA

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SAN DIEGO CONFORMITY WORKING GROUP

The San Diego Conformity Working Group may take action on any item appearing on this agenda.

Wednesday, November 17, 2004

10 a.m. to 11:30 a.m.

SANDAG, Conference Room D
401 B Street, Suite 800
San Diego, CA 92101-4231

Staff Contact: Elisa Arias
(619) 699-1936
ear@sandag.org

Please contact Elisa Arias prior to the meeting if you wish to participate by conference call.

SANDAG offices are accessible by public transit. Phone 1-800-COMMUTE or see www.sdcommute.com for route information.

SAN DIEGO CONFORMITY WORKING GROUP (CWG)

Wednesday, November 17, 2004

10 a.m. to 11:30 a.m.

ITEM #	ACTION
1. Introductions	
+2. Summary of October 13, 2004 Meeting	INFORMATION
3. Public Comments/Communications	
4. 2004 Regional Transportation Improvement Program (RTIP) Amendment No. 1	INFORMATION
<p>Staff from the U.S. Federal Highway Administration will provide an update on the upcoming approval and conformity finding of the San Diego region 2004 RTIP Amendment No. 1.</p>	
+5. 2030 Regional Transportation Plan (RTP) Amendment No. 1: Draft Air Quality Conformity Analysis	REVIEW AND COMMENT
<p>As requested by the Transportation Corridor Agencies an amendment to the 2030 RTP is being conducted for the Foothill Transportation Corridor South (FTCS) project. SANDAG released the attached draft conformity analysis for the 2030 RTP Amendment No. 1 on October 29, 2004 for a 30-day comment period. On December 10, 2004, the Transportation Committee will be asked to accept the amendment to the 2030 RTP for distribution and begin a 30-day public comment period. A public hearing is scheduled for January 21, 2005. The CWG will be asked to provide comments on the draft conformity analysis.</p>	
+6. EMFAC Emissions Model Updates	INFORMATION
<p>The California Air Resources Board (ARB) held workshops in October 2004 to discuss possible modifications to the statewide on-road motor vehicle emissions inventory and the EMFAC emissions model. ARB staff will summarize information relevant to the development of Eight-Hour Ozone and Particulate Matter (PM) State Implementation Plans and to transportation conformity.</p>	

ITEM #

ACTION

7. Development of State Implementation Plans

INFORMATION

ARB has convened a Southern California Working Group to assist in the development of the 8-Hour Ozone and fine Particulate Matter (PM2.5) State Implementation Plans. The first meeting is scheduled on November 10, 2004. Participants will report on items discussed at this meeting.

8. Other Business

+ next to agenda item indicates an attachment

The next meeting of the San Diego Region Conformity Working Group is scheduled on Wednesday, December 15, 2004, from 10 a.m. to 11:30 a.m. at SANDAG.

November 17, 2004

TO: San Diego Region Conformity Working Group
FROM: SANDAG Staff
SUBJECT: Summary of October 13, 2004 Meeting
ACTION: INFORMATION

Item #1: Introductions

Self-introductions were made. See attached attendance list.

Item #2: Summary of September 22, 2004 Meeting

There were no comments or corrections.

Item #3: Public Comments/Communications

There were none.

Item #4: 2004 Regional Transportation Improvement Program (RTIP)

Ms. Elisa Arias, SANDAG, reported that on October 4, 2004, the U.S. Department of Transportation (DOT) issued its conformity finding of the San Diego region 2004 RTIP. U.S. DOT also redetermined conformity of the 2030 Revenue Constrained Regional Transportation Plan to the regional emissions budgets of the One-Hour Ozone Maintenance Plan. Mr. Wade Hobbs, FHWA, stated that the 2004 Federal State Transportation Improvement Program (FSTIP) was also approved the same day but that several conditions were placed on the approval. As a result, the approval for SANDAG's upcoming 2004 RTIP Amendment No. 1 may be delayed until the fiscal constraint issues are resolved with the state. He also noted that Caltrans is working to provide sufficient information that would allow FHWA to lift the conditions.

Item #5: Request for Amendment of the 2030 Regional Transportation Plan for Foothill Transportation Corridor South Project: Schedule and Conformity Criteria and Procedures for Air Quality Analysis

Ms. Arias explained that the Transportation Corridor Agencies (TCA) has requested SANDAG to amend its 2030 Regional Transportation Plan (RTP) to include the Foothill Transportation Corridor South (FTCS) project as an eight-lane toll facility and to ensure that the project is consistent with the Southern California Association of Governments' 2004 RTP. SANDAG's present 2030 RTP shows the FTCS project as a six-lane toll facility. Ms. Arias continued that there are three alternatives to the alignment within the County of San Diego; all other alternatives are within Orange County only.

Ms. Carla Walecka, representing TCA, provided a brief history of the project and explained that TCA seeks to restore the eight-lane description in the 2030 RTP (the RTP adopted in 1996 described the facility as eight toll lanes, which included 6 general purpose lanes and two high occupancy vehicle (HOV) lanes). She explained that SCAG no longer has a requirement of two HOV lanes for this project. Sandy Johnson, Caltrans, asked about plans to connect the SR 241 to the I-5 in San Diego

County, and about the estimate of truck usage and potential impacts to PM 2.5. Ms. Johnson also asked Ms. Walecka to provide the contact information for the liaison for this project at Caltrans. Ms. Walecka was not familiar with specific designs of the facility and agreed to follow-up with a response to the previous questions.

Mr. Hobbs asked about the number of lanes and Ms. Arias clarified that the current RTP shows four lanes plus two HOV lanes and that the proposed amendment would describe the facility as an eight-lane mixed flow toll facility. Mr. Mike Brady, Caltrans, inquired about environmental issues related to the facility traversing parklands, and whether SANDAG's RTP EIR provides any detail about impacts to the parklands. Ms. Arias responded that the EIR for the 2030 RTP is a programmatic EIR, and that the expectation is that the detailed analysis would be provided by the individual project EIRs. Mr. Steve Luxemberg, FHWA, asked if preliminary air quality analysis had been done and if so, what the outcome was. Ms. Arias stated that SANDAG was seeking consultation with the CWG on the latest planning assumptions and other conformity criteria prior to running the models, but that preliminary model outputs showed the RTP would meet the emission budgets.

Ms. Heather Werdick, SANDAG, reviewed the proposed schedule for the RTP amendment. Ms. Sookyung Kim, SANDAG, provided an overview of the financial assumptions. She explained that state and federal planning regulations require the development of a revenue constrained plan, which means that the plan is based only on current sources and levels of federal, state, and local transportation revenue projected to the year 2030. This scenario includes federal and state formula funds as well as federal and state discretionary funds for existing projects. However, future increases in state and federal funds, the extension of the *TransNet* sales tax program beyond its current 2008 expiration date, or the establishment of other new revenue sources are not included in the revenue constrained scenario. The revenue assumptions discussed in the approved RTP remain the same for the proposed RTP amendment, including the assumptions for Toll Road Funding – the funding derived from debt financing backed by future toll revenues. This funding has been assumed to be available in the same time periods as the construction for the major phases of the SR 125 and SR 241 toll road projects. The revisions included in this RTP amendment have no impact on the revenue assumptions or on the proposed programming of projects against those revenues. As a result, the amendment would have no impact on the revenues or the programming. Mr. Hobbs replied that FHWA expects SANDAG to provide sufficient documentation that would demonstrate fiscal constraint of the entire RTP and RTIP to the adopted STIP.

Ms. Arias reviewed the latest planning assumptions as follows:

1. Use of Latest Planning Assumptions: the air quality conformity analysis of the 2030 RTP Amendment No. 1 will use the Final 2030 Cities/County Forecast, which includes population, housing, and employment growth projections adopted by the SANDAG Board of Directors in December 2003.

SANDAG's network-based regional transportation model will be run for the following analysis years: 2010, 2014, 2020, and 2030. The modeling methodology has not changed since the preparation of the 2030 RTP or 2004 RTIP. However, SANDAG updates the model periodically by validating against the most recent 2000 Census and other data. Ms. Arias stated that SANDAG will use the vehicle inventory data included in the EMFAC2002 emissions model.

2. Transportation Control Measures (TCMs): four TCMs are identified in the 1982 State Implementation Plan (SIP). They include ridesharing, transit service improvements, traffic flow

improvements and bicycle facilities program. No TCMs have been removed or substituted from the One-Hour Ozone Maintenance Plan, which is the applicable SIP. The amendment to the FTCS facility has no impact on TCMs.

To follow up on the September meeting of the CWG, Ms. Arias also stated that SANDAG is trying to find a copy of the final 1982 SIP as approved by the U.S. EPA to review the description of TCMs to determine whether they should continue to be reported if all TCMs have been implemented. She explained that Ms. O'Connor had agreed to ask U.S. EPA staff to search the archives.

3. Latest Emissions Model: SANDAG will use EMFAC 2002 to conduct the regional emissions forecasts.
4. Emissions Budget: SANDAG will use the approved One-Hour Ozone Maintenance Plan budgets (2010 and 2014) and the 1993 Carbon Monoxide (CO) budget. Regional emissions forecasts will be prepared for 2010, 2014, 2020, and 2030. If the 2003 budget included in the CO Maintenance Plan update is found adequate by the U.S. EPA prior to SANDAG's conformity determination, then the new budget will be used.

Mr. Luxenberg requested that SANDAG compare the projected CO emissions to the current and new draft CO budgets, as it was done for the 2004 RTIP. Ms. Arias concurred with the approach. Mr. Luxenberg also asked about the age of the vehicles fleet data in EMFAC 2002. Mr. Dennis Wade, ARB, stated that the fleet is as of the year 2000. He continued that ARB plans to release a draft EMFAC 2005 in the spring of 2005. Mr. Luxenberg asked when it would be available for conformity. Mr. Wade stated that ARB would initiate consultation with Caltrans, FHWA and EPA on that matter.

Heather Werdick, SANDAG, briefly described the public participation process for the 2030 RTP amendment. Ms. Werdick explained that the amendment would be released for a 30-day public review period and that a public hearing would be held at the Transportation Committee meeting in January 2005. The public also may provide comments at the Board of Directors meeting before the amendment is considered for approval in late January 2005.

Item #6: Other Business

Ms. Arias pointed out that the next meeting is November 17th, not December 15th as shown in the agenda.

Ms. Karina O'Connor, EPA, confirmed that the Statewide CWG meeting would be on November 3, 2004. Caltrans District 11 will host the regional call in center.

Mr. Wade informed the CWG that he is now the main contact for transportation conformity at ARB as Doug Ito has been assigned other responsibilities.

San Diego Region Conformity Working Group

Meeting Attendance

October 13, 2004

Name

Agency

Carl Selnick	San Diego Air Pollution Control District
Steve Luxenberg/Wade Hobbs (phone)	U.S. Federal Highway Administration
Mike Brady (phone)	Caltrans Headquarters
Sandy Johnson/Fulgene Cortez	Caltrans District 11
Carla Walecka (phone)	Transportation Corridor Agencies
Karina O'Connor (phone)	U.S. Environmental Protection Agency
Dennis Wade (phone)	California Air Resources Board
Elisa Arias	SANDAG
Sookyung Kim	SANDAG
Heather Werdick	SANDAG

APPENDIX C

AIR QUALITY PLANNING AND TRANSPORTATION CONFORMITY

Background

The U.S. EPA has added two new standards to protect public health: measuring ozone levels over eight-hour periods and measuring smaller particulate matter (PM) in the air. The more stringent Eight-Hour ozone standard will protect the public against longer exposure periods. The new fine particulate matter standard (PM_{2.5}) will focus more protection against the smaller particles, which pose an increased health risk.

The U.S. EPA has designated the San Diego region as a Basic non-attainment for the Eight-Hour Ozone standard, under Subpart 1 of the Clean Air Act. This designation took effect on June 15, 2004. SANDAG must demonstrate conformity of both the RTP and RTIP to the Eight-Hour Ozone standard by June 15, 2005. The PM_{2.5} designation is expected in late 2004.

The federal Clean Air Act (CAA), which was last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. California has adopted state air quality standards that are more stringent than the NAAQS. Areas with levels that exceed the standard for specified pollutants are designated as non-attainment areas.

The EPA requires that each state containing non-attainment areas develop plans to attain the NAAQS by a specified attainment deadline. These attainment plans are called State Implementation Plans. The San Diego County Air Pollution Control District (APCD) prepares the San Diego portion of the California State Implementation Plan (SIP). Once the standards are attained, further plans – called Maintenance Plans – are required to demonstrate continued maintenance of the NAAQS.

The 1982 SIP anticipated attaining federal ozone and carbon monoxide standards by 1987. However, these standards were not attained at that time. In 1988, the California Clean Air Act (CCAA) was enacted requiring the APCD to prepare a revised Regional Air Quality Strategy (RAQS) for achieving the state and, by extension, the less stringent national air quality standards.

The San Diego region has been designated by the U.S. Environmental Protection Agency (EPA) as a federal maintenance area for the One-Hour Ozone standard. The region attained the federal One-Hour ozone standard in 2001. The U.S. EPA redesignated the San Diego air basin as attainment/maintenance and approved the One-Hour Ozone Maintenance Plan as a State Implementation Plan (SIP) revision, effective on July 28, 2003. The San Diego air basin still is classified as a “serious” ozone non-attainment area under the state Clean Air Act.

The San Diego region also has been designated by the U.S. EPA as a federal maintenance area for the Carbon Monoxide (CO) standard. The CO standard was attained in 1993, and the EPA approved a ten-year Maintenance Plan in 1998. The California Air Resources Board (ARB) approved the update of the CO Maintenance Plan for the San Diego region and other urban areas on July 22, 2004. This Maintenance Plan

shows how these areas will continue to maintain the CO standard through 2018. ARB anticipates submitting this plan to the U.S. EPA for approval as a SIP revision in November 2004. Once the U.S. EPA issues a budget adequacy finding, the CO budget contained in the Maintenance Plan update will become the applicable budget for transportation conformity purposes.

On April 15, 2004, the U.S. EPA designated the San Diego region as a nonattainment area for the federal Eight-Hour Ozone standard. This designation became effective on June 15, 2004. Moreover, the non-attainment classification, based on the amount of pollutant above the standard, determines the minimum control requirements and the federal attainment deadline. The air basin has been classified as a Basic nonattainment area and the attainment date for the Eight-Hour Ozone standard is June 15, 2009.

SANDAG, as the Metropolitan Planning Organization (MPO) for the San Diego region, must demonstrate that the Regional Transportation Plan (RTP) and the Regional Transportation Improvement Program (RTIP) are in conformity with the SIP for meeting air quality standards. The U.S. Department of Transportation (DOT) signs off on conformity of the region's RTP and RTIP. Conformity determinations for transportation plans, programs, and projects are based on the DOT/EPA conformity rule issued in November 1993 and its subsequent revisions. As a result of the amendment to the 2030 RTP, a new regional emissions analysis and conformity determination have been conducted for the 2030 Revenue Constrained RTP and the 2004 RTIP simultaneously for the One-Hour Ozone and CO standards.

SANDAG also must demonstrate conformity of both the 2030 RTP and the 2004 RTIP to the Eight-Hour Ozone standard by June 15, 2005. A new conformity determination will be conducted in the upcoming months to ensure this deadline is met.

Transportation Conformity: Regional Emissions Analysis & Modeling Procedures

Introduction

The 2030 Regional Transportation Plan includes policies and programs to improve mobility in the San Diego region to the year 2030. The RTP is, in essence, three long-range plans. Besides the 2030 Mobility Plan, which is based on reasonably expected transportation funding and the Unconstrained Revenue Plan, SANDAG developed a 2030 Revenue Constrained Plan for the purpose of conducting the air quality conformity analysis.¹

Appendix A of the 2030 RTP describes the Revenue Constrained Plan and Chapter 4 of the 2030 RTP provides information on revenue assumptions (Table 4.3-Major Revenue Sources – Revenue Constrained Revenue Scenario and Table 4.4-Major Expenditures – Revenue Constrained Scenario). In particular, Appendix A includes the description, estimated cost, and phasing of the Foothill Transportation Corridor South (FTCS) facility as amended (Table A.1-Major Capital Improvements – Revenue Constrained Plan, Table A.2-Phased Highway Projects – Revenue Constrained Plan, Table A.9-Major Capital Improvements – Differences between Scenarios, and Table A.13 – Summary of Highway Scenarios).

As explained in the Background section of this Appendix, SANDAG and the U.S. DOT must make a determination that the Revenue Constrained Plan conforms to the SIP for air quality. Conformity to the SIP

¹ Consistent with 23 CFR 450, the *2030 Revenue Constrained Transportation Plan* includes only those facilities and programs that could be funded with existing state and federal programs and with the current *TransNet* local sales tax program, which expires in 2008.

means that transportation activities will not create new air quality violations, worsen existing violations, or delay the attainment of the national ambient air quality standards.

DOT made the conformity determination for the 2030 RTP on April 9, 2003 and found the 2004 RTIP in conformity on October 4, 2004.

To evaluate transportation conformity, emissions forecasts were produced for four analyses years: 2010, 2014, 2020, and 2030.

The SANDAG Board of Directors will be asked to make a finding of conformity of Amendment No. 1 of the 2030 Revenue Constrained Plan and the 2004 RTIP, and to adopt Amendment No. 1 of the 2030 RTP on January 28, 2005.

Growth Forecasts

Every three to five years, SANDAG produces a long-range forecast of population, housing, and employment growth for the San Diego region. The most recent is the Final 2030 Cities/County Forecast, which was accepted by the SANDAG Board of Directors for use in planning studies on December 19, 2003.

The forecast process relies on three integrated forecasting models. The first one, the Demographic and Economic Forecasting Model (DEFM), provides a detailed econometric and demographic forecast for the entire region. The second one, the Interregional Commuting Model, provides a forecast of interregional commuting expected during the forecast period. The third one, the Urban Development Model, allocates the results of the first two models to subregional areas based upon the current plans and policies of the jurisdictions.

The Final 2030 Cities/County Forecast is based solely on the general and community plans of the 18 cities as adopted. For the unincorporated area, the forecast is based on the most recent (December 2002) version of the County's GP2020 plan update, as the Board of Supervisors feels that it most accurately reflects the County's future direction.

SANDAG consulted with the San Diego Region Conformity Working Group (CWG) on the use of the Final 2030 Cities/County Forecast for the air quality conformity analysis of Amendment No. 1 of the 2030 RTP. Both DOT and the EPA have concurred that approved plans should be used as input in the air quality conformity process. Table 1 shows the regional population and employment growth forecast for the San Diego region through 2030.

TABLE C.1—SAN DIEGO REGIONAL POPULATION AND EMPLOYMENT FORECAST

Final 2030 Cities/County Forecast		
Year	Total Population	Total Employment
2000	2,813,833	1,384,676
2010	3,211,721	1,528,522
2020	3,528,605	1,672,883
2030	3,855,085	1,824,030

Source: SANDAG, 2003

Transportation Modeling

SANDAG follows a widely used four-step transportation modeling process to forecast travel activity in the San Diego region. Travel forecasting procedures are described in more detail in SANDAG's *Regional Transportation Models* (1995) and the *Preliminary 2030 Forecast Process and Model Documentation* (April 2003), which are available upon request.

The estimates of regional transportation-related emissions analysis meet the requirements established in the Transportation Conformity Rule, Sections 93.122(b) and 93.122(c). These requirements relate to the procedures to determine regional transportation-related emissions, including the use of network-based travel models, methods to estimate traffic speeds and delays, and the estimation of vehicle miles of travel.

Tranplan is the transportation planning computer package used to forecast travel activity utilizing datasets that are maintained in the geographic information system (GIS). The transportation modeling steps consist of:

1. Generating average weekday person trip ends in each zone,
2. Estimating trip movements between zones using a trip distribution model,
3. Allocating trips to different forms of transportation using a mode split model, and
4. Assigning vehicle trips to road segments using a traffic assignment model.

Two iterations through the modeling process are made to reach equilibrium between transportation facilities and demand, where congested travel times from the first iteration are input to the second iteration.

The transportation models require two major inputs. One input is a zonal level households and land use forecast, which determines the number of trips generated. Highway and transit system networks are the other key input that affects the amount and location of vehicular travel.

Highway Networks

The regional highway networks in the 2030 RTP include all roads classified by local jurisdictions in their circulation elements. These roads include freeways, expressways, and the Regional Arterial System (RAS). The RAS consists of all conventional state highways, prime arterials, and selected major streets. In addition, some residential streets are included in the networks for connectivity between zones.

The route improvements and additions in the 2030 RTP are developed as an integral part of San Diego's regional growth management and forecasting process. They are intended to provide adequate travel service that is compatible with adopted regional policies for land use and population growth. All regionally significant projects from the 2004 Revenue Constrained RTP are included in the quantitative emissions analysis. These include all state highways, all proposed National Highway System routes, all regionally significant arterials, and all FHWA functionally classified "Other Principal Arterials."

The networks also account for programs intended to improve the operation of the highway system, including high occupancy vehicle (HOV) lanes and ramp metering. Existing and proposed toll facilities also are modeled to reflect time, cost, and capacity effects of these facilities. The SR 125 South project and SR 241 are the only modeled toll facilities in the San Diego region.

In addition, several managed/HOV lanes are included in the Revenue Constrained Plan. Facilities with proposed managed lanes include I-5, I-15, I-805, and SR 52. It is assumed that the excess capacity not utilized by carpools and transit on HOV routes with two or more lanes in the peak direction as well as reversible HOV routes would be managed so that single occupant vehicles could use these lanes under a pricing mechanism. Traffic flows would be managed so that the facility would operate at level of service C or better.

Based on the networks and programs described above, the 2030 RTP transportation forecasts differentiate between single occupant and multioccupancy or high occupancy vehicle travel times. SANDAG normally maintains networks for 2000 (the 2030 Cities/County Forecast base year) and the years 2010, 2020, and 2030. A 2014 network also was created to conduct the air quality conformity analysis of Amendment No. 1 of the 2030 RTP for the 2014 One-Hour ozone emissions budgets.

Appendix A lists the major highway projects included in the analysis. The description, estimated cost, and phasing of the Foothill Transportation Corridor South (FTCS) facility as amended are shown in Table A.1-Major Capital Improvements – Revenue Constrained Plan, Table A.2-Phased Highway Projects – Revenue Constrained Plan, Table A.9-Major Capital Improvements – Differences between Scenarios, and Table A.13 – Summary of Highway Scenarios).

Locally funded regionally significant projects also have been included in the air quality conformity analysis. These projects are funded with *TransNet* funds, a 20-year half-percent local sales tax for transportation that expires in 2008, and other local revenue sources.

Transit Networks

SANDAG also maintains transit network datasets for existing and proposed transit systems. Bus speeds assumed in the transit networks are derived from modeled highway speeds and reflect the effects of congestion. Regional and express transit routes on surface streets are assumed to operate out of congestion due to priority transit treatments. Higher bus speeds may result for transit vehicles operating on highways

with HOV lanes and HOV bypass lanes at ramp meters, compared to those routes that operate on highways where these facilities do not exist.

Transit fares are an output of the transit network procedures, which replicate complex fare policies that differ between:

1. Buses which collect a flat fare of between \$1.50 and \$3.00 depending on the type of service,
2. Trolleys which charge a variable fare of between \$1.25 and \$2.50 depending on how many stations are traversed,
3. Commuter rail which has a zone-based fare of between \$3.50 and \$4.65,
4. Regional Bus Rapid Transit (BRT) which is assumed to charge a distance-based fare of between \$0.14 and \$0.60 per miles that replicates limited express and commuter rail fares, and
5. Corridor BRT, which is assumed to use trolley station-based fares.

Fares are assumed to remain constant in real dollars over the forecast period.

Locally funded regionally significant transit projects have been included in the air quality conformity analysis of the 2030 RTP. These transit projects also are funded with *TransNet* funds or other local revenue sources. Once network coding is completed, the transportation models are run for the applicable scenarios (2010, 2014, 2020, and 2030). Appendix A lists the major regional transit projects included in the analysis. Amendment No. 1 of the 2030 Revenue Constrained RTP includes no changes, additions, or deletions to regional transit projects.

Trip Generation

Trip generation is the first step in the transportation modeling process. Average weekday trip ends by all forms of transportation starting and ending in each zone are estimated for ten trip types: home-work, home-college, home-school, home-shop, home-other, work-other, and other-other, serve passenger, visitor, and airport.

The trip generation model works by applying trip rates to zone level growth forecasts. Trip production rates are expressed as trips per household. Trip production rates vary by trip type and structure type. Trip attractions are expressed as trips per acre of nonresidential land use or trips per household. Trip attraction rates vary by trip type and land use category. The Final 2030 Cities/County Forecast was used to produce trip generation forecasts for the years 2010, 2014, 2020, and 2030.

In recent years, urban planners have engaged in a debate about whether increasing highway capacity generates induced travel. Most opinions revolve around the following ideas:

- Households will make new trips because adding highway capacity reduces the cost or time spent traveling to a location. However, travel costs or travel times will ultimately increase over time as more vehicles use a facility and the new road begins to experience congestion.

- New facilities may cause a diversion of existing trips from more congested roads to less congested ones. New land uses along a corridor also may result in redistribution of trips to a new destination using an alternative route, but do not necessarily cause more trips overall.

SANDAG's regional transportation model uses a relatively high trip generation rate for households (8.1 vehicle trips per day), which may account for possible increases in trip making as new facilities are built. Also, the model accounts for travel diversion among facilities.

Trip Distribution

After trip generation, trip movements between zones are determined using a trip distribution gravity model. Inputs to the trip distribution model include zone level trip generation forecasts by trip type, zone-to-zone travel times, and friction factors by trip type.

Travel times are based on the 2030 RTP network scenarios. Highway improvements may induce longer trip lengths by allowing motorists to travel farther in the same amount of time. This effect is represented with the trip distribution model. Travel times differ between initial and final model iterations. Initial travel times reflect free-flow conditions, and final times reflect the effects of congestion.

Mode Choice

At this point in the modeling process, total person trip movements between zones are split into different forms of transportation: drive alone, 2-person carpools, 3+ person carpools, transit, and other (bicycling and walk). Trips between zone pairs are allocated to modes based on the cost and time of traveling by a particular mode compared to the cost and time of traveling by other modes. For example, vehicle trips on a congested route would be more likely to be diverted to light rail than vehicle trips on an uncongested freeway.

Income level also is considered since surveys show that high-income travelers are more concerned about the level of service offered by a mode than those with lower incomes. The mode choice model is calibrated using 1995 Travel Behavior Survey trip tables by mode and income and 1995 Regional Transit Survey transit trip characteristics. Preliminary Census 2000 journey-to-work data and 2000 onboard transit passenger counts also are used in the calibration process.

A number of data files are input to the mode choice model. These include:

- Zonal incomes
- Trip tables from the distribution model
- Peak and off-peak period highway times
- Peak period HOV times
- Peak and off-peak period transit times
- Transit fares
- Auto driving and parking costs
- Transit accessibility measures

Highway and transit travel time datasets differ between initial and final passes through the modeling process. Final iteration times reflect congestion effects identified in the first iteration.

The model produces a.m. peak, p.m. peak, and off-peak period trip tables for vehicles and transit riders. The a.m. peak period is from 6:00 to 9:00 in the morning and the p.m. peak period is from 3:00 to 6:00 in the afternoon. The off-peak period covers the remaining 18 hours of the day. A series of mode choice model runs were performed in the course of analyzing the 2030 RTP scenarios through two model iterations.

Highway Assignment

Highway assignment produces traffic volume estimates for all roadway segments in the system. These traffic volumes are an important input to emissions modeling.

The highway assignment model works by finding roads that provide the shortest travel time between each zone pair. Trips between zone pairs are then accumulated on road segments making up minimum paths. Highway travel times consider posted speed limits, signal delays, and congestion delays. The model computes congestion delays for each segment based on the ratio of the traffic volume to roadway capacity. Four iterations of equilibrium assignment and capacity restraint are performed within each assignment model run.

Motorists may choose different paths during peak hours when congestion can be heavy and off-peak hours when roadways are typically free flowing. For this reason, traffic is assigned separately for a.m. peak, p.m. peak, and off-peak periods.

Vehicle trip tables for each scenario reflect increased trip-making due to population growth and variations in travel patterns due to the alternative transportation facilities/networks proposed.

Model accuracy is assessed by comparing model estimated 2000 traffic volumes with actual traffic counts obtained through SANDAG's traffic monitoring program and Highway Performance Monitoring System (HPMS) estimates of vehicle miles of travel (VMT).

Post-Tranplan Processing

Standard Tranplan output needs to be reformatted and adjusted to be useful for emissions modeling. Several routines and computer programs have been written to accomplish the following major functions:

- Correcting link specific traffic volume forecasts for calibration error
- Adding in estimated travel on roads not in the transportation modeling process
- Computing link speeds based on corrected link volumes, Highway Capacity Manual relationships between congestion and speed (or signal delay)
- Splitting link volumes into heavy-duty truck and other traffic to obtain speed distributions by vehicle class
- Preparing a data set that contains total VMT, number of trip starts, and VMT by speed category by time of day for each vehicle class

Post-Tranplan processing routines are performed twice. First, they are run after the initial model iteration to provide travel times for the final model iterations. Second, they are performed on the final model assignments to provide inputs for emissions modeling.

Motor Vehicle Emissions Modeling

Emissions Model

In October 2002, ARB released EMFAC 2002, a new emissions inventory model that calculates emissions for motor vehicles operating in California. It is an integrated model that combines emission rate data with vehicle activity to calculate regional emissions. EPA approved EMFAC 2002 for use in conformity determinations on April 1, 2003.

The EMFAC 2002 model supports calculation of emissions for the Burden mode. The Burden mode is used for calculating regional emission inventories. In this mode, the model reports total emissions as tons per day for each pollutant, by vehicle class and the total vehicle fleet. The Burden mode uses emission factors that have been corrected for ambient conditions and speeds combined with vehicle activity to calculate emissions in tons per day. Vehicle activity includes the number of vehicles, daily vehicle miles traveled, and the number of daily trips.

The air quality analysis for Amendment No. 1 of the 2030 RTP was conducted using EMFAC 2002's Burden mode. Projections of daily regional emissions were prepared for reactive organic gases (ROG), nitrogen oxides (NO_x), and carbon monoxide (CO).

On-road motor vehicle emissions are attributed to several different processes:

- Starting exhaust
- Running exhaust
- Idle exhaust (calculated for heavy-duty trucks only)
- Resting and diurnal evaporation
- Running losses
- Hot soak evaporation

Emission factors vary by vehicle class, fuel usage, and technology. Thirteen vehicle classes are modeled: passenger car, two types of light-duty trucks, medium-duty truck, two types of light-heavy-duty trucks, medium-heavy-duty truck, heavy-heavy-duty truck, line-haul vehicle, urban bus, school bus, motorcycle, and motor-home. The fuels modeled are gasoline, diesel, and electrically powered vehicles. Technology categories can be grouped into catalyst, noncatalyst, and diesel.

Emission factors for processes that vary by temperature (i.e., starting exhaust, hot soak, and running exhaust) are broken down further by specified temperature ranges. Exhaust emission factors also are broken down by speed range.

Regional Emissions Forecasts

Regional transportation forecasts were initiated in October 2004 by updating the highway network to reflect the amendment to the FTCS project. Output from the Tranplan model was then reformatted and adjusted to be useful for emissions modeling.

Countywide forecasts of average weekday ROG, NOx, and CO emissions were produced for 2010, 2014, 2020, and 2030 using the EMFAC 2002 model. The analysis years were selected to comply with Sections 93.106(a)(1) and 93.118 (a) of the Transportation Conformity Rule. According to these sections, the first horizon year (2010) must be within ten years from the base year used to validate the regional transportation model (2000), the last horizon year must be the last year of the transportation plan's forecast period (2030), and the horizon years may be no more than ten years apart (2020). In addition, the regional emissions analysis must be conducted for the emissions budgets in the applicable SIP (ROG and NOx budgets for 2010 and 2014).

ROG and NOx emissions are based on the summer season, while CO emissions are based on the winter season.

Emissions Modeling Results

An emissions budget is the part of the SIP that identifies emissions levels necessary for meeting emissions reduction milestones, attainment, or maintenance demonstrations.

Amendment No. 1 of the 2030 RTP must meet the ozone motor vehicle emissions budgets contained in the 2002 One-Hour Ozone Maintenance Plan. This Maintenance Plan established ROG and NOx budgets for 2010 and 2014. EPA made a budget adequacy finding on May 14, 2003. On June 26, 2003, EPA approved the Maintenance Plan and motor vehicle emissions budgets as SIP revisions. These SIP revisions became effective on July 28, 2003.

Amendment No. 1 of the 2030 RTP also must meet the 1993 CO emissions budget established in the CO Maintenance Plan that was approved by EPA in June 1998.

As shown in Table 2, the projected emissions of ROG, NOx, and CO from both the 2004 RTIP and Amendment No. 1 of the 2030 Revenue Constrained RTP are lower than the One-Hour Ozone Maintenance Plan and CO Maintenance Plan emissions budgets.

The California Air Resources Board (ARB) approved the update of the CO Maintenance Plan for the San Diego region and other urban areas on July 22, 2004. This Maintenance Plan shows how these areas will continue to maintain the CO standard through 2018. ARB anticipates submitting this plan to the U.S. EPA for approval as a SIP revision in November 2004. Once the U.S. EPA issues a budget adequacy finding, the CO budget contained in the Maintenance Plan update will become the applicable budget for transportation conformity purposes.

On July 22, 2004, ARB approved the CO Maintenance Plan update for the San Diego region and established the 2003 CO budget at 730 tons per day. This CO budget would become the applicable budget for conformity determinations for 2003 and subsequent years after EPA makes a budget adequacy finding. The projected CO emissions from Amendment No. 1 of the 2030 RTP and 2004 RTIP also are below the new CO budget.

Table 2 summarizes the 2004 RTIP and Amendment No. 1 of the 2030 Revenue Constrained Plan air quality conformity analysis and the budget test for the current motor vehicle emissions budgets. This analysis shows that both the 2004 RTIP and Amendment No. 1 of the 2030 Revenue Constrained Plan (including interim years) meet the applicable budgets.

**TABLE C.2—2030 SAN DIEGO REVENUE CONSTRAINED PLAN (AMENDMENT 1)
& 2004 RTIP AIR QUALITY CONFORMITY ANALYSIS**

Year	Average Weekday Vehicle Starts (1,000s)	Average Weekday Vehicle Miles (1,000s)	CO		ROG		NOx	
			SIP Emissions Budget Tons/Day	CO Emissions Tons/Day	SIP Emissions Budget Tons/Day	ROG Emissions Tons/Day	SIP Emissions Budget Tons/Day	NOx Emissions Tons/Day
2010	15,242	83,032	1,195	423.40	46	43	88	80
2014	15,789	86,912	1,195	315.08	36	33	66	58
2020	16,784	93,281	1,195	219.22	36	26	66	40
2030	18,383	104,922	1,195	141.98	36	18	66	24

Exempt Projects

Section 93.126 of the Transportation Conformity Rule exempts certain highway and transit projects from the requirement to determine conformity. The categories of exempt projects include safety, mass transit, air quality (ridesharing and bicycle and pedestrian facilities), and other (such as planning studies).

Amendment No. 1 of the 2030 Revenue Constrained RTP includes no changes, additions, or deletions to exempt projects.

IMPLEMENTATION OF TRANSPORTATION CONTROL MEASURES

There are four TCMs that must be implemented in San Diego, which the SIP refers to as Transportation Tactics. They include ridesharing, transit service improvements, traffic flow improvements, and bicycle facilities and programs.

These TCMs were established in the 1982 SIP, which identified general objectives and implementing actions for each tactic. No TCMs have been removed or substituted from the One-Hour Ozone Maintenance Plan, which is the applicable SIP. Amendment No. 1 of the 2030 Revenue Constrained RTP includes no changes, additions, or deletions to projects classified as TCMs.

Interagency Consultation Process and Public Input

The consultation process followed to prepare the air quality conformity analysis for the 2030 Revenue Constrained Plan complies with the San Diego Transportation Conformity Procedures adopted in July 1998. In turn, these procedures comply with federal requirements under 40 CFR 93. Interagency consultation involves SANDAG (as the MPO for San Diego County), the APCD, Caltrans, ARB, DOT, and EPA.

Consultation is a three-tier process that:

1. formulates and reviews drafts through a conformity working group,
2. provides local agencies and the public with opportunities for input through existing regional advisory committees and workshops, and
3. seeks comments from affected federal and state agencies through participation in the development of draft documents and circulation of supporting materials prior to formal adoption.

SANDAG consulted on the development of the air quality conformity analysis of Amendment No. 1 of the 2030 RTP at the meeting of the San Diego Region Conformity Working Group (CWG) held on October 20, 2004. Staff reviewed the schedule for the preparation of Amendment No. 1 of the 2030 RTP and discussed criteria and procedures for determining conformity. Items discussed included the revenue assumptions for the amendment, the use of latest planning assumptions (population and employment forecasts, travel demand model methodology, and vehicle inventory data), implementation of TCMs, emissions model and budgets, consultation and public involvement, and exempt projects.

On October 29, 2004, SANDAG released the draft 2004 air quality conformity analysis for Amendment No. 1 of the 2030 RTP for a 30-day public review and comment period. On that date, it also was distributed to the San Diego Region CWG. The draft air quality analysis is scheduled to be discussed by the San Diego Region CWG at its meeting on November 17, 2004.

Planning Milestones

- ✔
⚠
?
Freeze SIP baseline inventory Spring '05
- ◆
Emission targets Summer '06
- ◆
Draft plans Fall '06
- ◆
Local & State plan adoption Early '07
- ◆
Ozone plans due to U.S. EPA June '07
- ◆
PM2.5 plans due to U.S. EPA February '08



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Transportation Activity Updates

- ◆
 Need transportation activity updates this December as part of EMFAC2005
- ◆
 Begin using working EMFAC2005 to identify emission targets starting mid-2005
- ◆
 Need final critical activity updates prior to release of proposed air plans in 2006

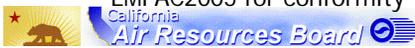


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Use of EMFAC2005 for Transportation Conformity

- ◆
 Early 2007: Transmit model to U.S. EPA
- ◆
 June 2007: Submit SIPs to U.S. EPA (with EMFAC2005 budgets)
- ◆
 Fall 2007: U.S. EPA approves model, finds budgets adequate

Transportation agencies use EMFAC2005 for conformity



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Key Points ...

- ◆
 Need updated inventory for plans by mid-2005 to support modeling/controls
- ◆
 Timing of transportation activity updates and EMFAC 2005 transmittal critical to smooth conformity process



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Summary of Proposed Modifications to the On-Road Motor Vehicle Emissions Inventory



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The EMFAC Model

- ◆
 Latest Version - April, 2003
- ◆
 Schedule - June, 2005
- ◆
 Usability updates may come after June, 2005



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Planning Milestones and EMFAC Model Updates

Overview - On-Road Vehicles

- ◆ The EMFAC Model
- ◆ Heavy Duty Diesel Trucks
- ◆ Fuel Correction Factors
- ◆ Inspection and Maintenance
- ◆ Motor Vehicle Activity
- ◆ Miscellaneous Updates

California Air Resources Board

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Heavy Duty Diesel Trucks

- ◆ Emissions test data based on CRC E-55/E-59 Study
- ◆ Refuse Trucks/Fuel Tankers
- ◆ Other Considerations

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Heavy-Heavy Duty Updates

- ◆ Basic Emission Rates
 - Low Idle
 - High Idle
 - Running Exhaust
- ◆ Speed Correction Factors
- ◆ Load Correction Factors

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Other Considerations

- ◆ HHDV Brake Wear
- ◆ NAFTA Impact Estimates
- ◆ Chip Reflash
- ◆ Deterioration Rates
 - Malfunction/Tampering

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On-Road Fuel Correction Factors

- ◆ Update benefits of clean diesel
- ◆ Update out-of-state/out-of-country diesel purchases
- ◆ Correct RFGII & III to be cumulative within the model
- ◆ Reflect the impact of ethanol in gasoline

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Inspection and Maintenance

- ◆ Reflect Benefits of Low Pressure Leak Check
- ◆ Reflect the Percentage of Vehicles in each Program Type by Geographical Area
- ◆ Reflect the Benefits of a Liquid Leak Check
- ◆ Heavy -Duty Gasoline ASM Benefits
- ◆ 6 Year New Vehicle Exemption
- ◆ 30 Year Older Vehicle Exemption Removed
- ◆ Change of Ownership

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Planning Milestones and EMFAC Model Updates

Vehicle Activity

- ◆ Modify the model to reflect the latest speed and VMT submissions from COG's and MPO's
- ◆ Submit by December 1, 2004 for inclusion in EMFAC directly
- ◆ Work with COGs/MPOs to reflect latest estimates for motor vehicle budgets



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Heavy Duty Truck Distribution

- ◆ Evaluate distribution of heavy duty diesel truck VMT
- ◆ Based on CALTRANS and other survey data
- ◆ Work with COGs/MPO to reconcile local issues



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Other Miscellaneous Updates

- ◆ Create an "Other Bus" vehicle category for buses other than Transit or School
- ◆ Update Vehicle Population Estimates
- ◆ Update Mileage Accrual Rates
- ◆ Adjust Heavy -Duty Gas Evaporative Inventory Using Latest Data (ATL)
- ◆ Develop Facility-Specific Emissions Estimates



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